

Classical Biological Control of Soil Insects in Field Corn and Alfalfa

Elson Shields and Tony Testa

Department of Entomology
Cornell University, Ithaca, NY

Abstract:

Recent research results in New York and Pennsylvania have shown that the entomopathogenic nematode *Heterorhabditis bacteriophora* 'Oswego' has a significant impact on the populations of corn rootworm, clover root curculio, alfalfa snout beetle and will persist in field plots for more than 5 years from a single inoculation. The availability of a effective persistent nematode "opens the door" for nematode research in the more classical biological control perspective of establishment and augmentation rather than the historical "biopesticide" approach of inundative releases.

This study monitors the population changes of established nematode populations when the cropping system is changed from continuous corn to other typical rotated crops on the dairy farm. Changing cropping systems has a significant impact on potential insect hosts for entomopathogenic nematodes since many of the soil insects which feed on crops are adapted to a narrow range of plant species.

The 1997 growing season was the crop rotation year which new crops were established in the continuous corn plots inoculated with nematodes in either 1995 or 1996. In all of the plots previously inoculated, nematodes levels at the beginning of the 1997 growing season were fairly high. As expected, nematode populations dropped throughout the growing season with the absence of insect hosts. Nematode populations in the plots rotated to alfalfa and alfalfa/timothy declined at a similar rate as the fallow plots. The continuous corn plots were severely damaged from wildlife feeding and had to be replanted during mid-June. As a result, the corn rootworm population failed to become established and the nematode population also declined in the continuous corn plots. The nematode levels in all plots are at a low level entering into the winter 1997. During 1998, new populations of soil herbivores failed to colonize each of the treatments (rotated crops) resulting in a continuing decline of entomopathogenic nematode populations.

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IPM House
630 W. North St.
New York State Agricultural Experiment Station
Geneva NY 14456
315-878-2353